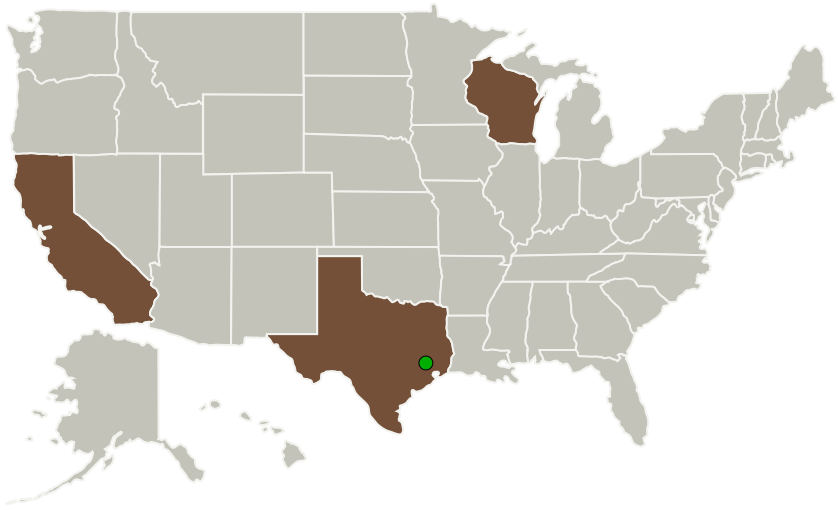
Highly Accurate Sensor for High-Purity Oxygen Determination, Phase I

Completed Technology Project (2011 - 2012)

Project Introduction

In this STTR Phase I effort, Los Gatos Research (LGR) and Professor Scott Sanders (Mechanical Engineering Department, University of Wisconsin - Madison) propose to develop a highly-accurate sensor for high-purity oxygen determination. The analyzer, which is based on near-infrared tunable diode laser absorption spectrometry (TDLAS) and LGR's patented Off-Axis Integrated Cavity Output Spectrometry (Off-Axis ICOS), will be capable of rapidly quantifying high-purity oxygen (95 - 100 %) with very high accuracy (to better than ± 0.05 %), minimal calibration, and no zero drift. The analysis will be completely specific and exhibit no measurable cross-interferences from other background species (e.g. argon, nitrogen, water vapor, CO, CO2, or small organics). Moreover, the analyzer will be low-power, battery-operable, require no consumables, and sufficiently compact and robust for adaptability to future space missions. The high-purity oxygen sensor will help characterize NASA oxygen generators for breathing and propulsion applications.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Los Gatos Research	Lead Organization	Industry	Mountain View, California
Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas
University of Wisconsin-Madison	Supporting Organization	Academia	Madison, Wisconsin

Primary U.S. Work Locations	
California	Texas
Wisconsin	

Project Transitions

February 2011: Project Start

February 2012: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140245)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Los Gatos Research

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Manish Gupta

Co-Investigator:

Manish Gupta

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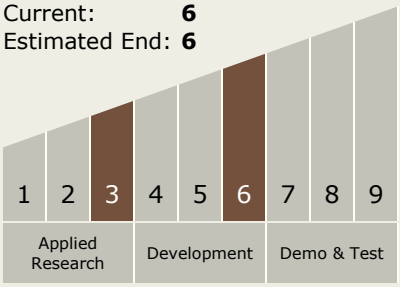
Technology Maturity (TRL)

Start: **3**
Current: **6**
Estimated End: **6**



Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.4 Environmental Monitoring, Safety, and Emergency Response
    - TX06.4.3 Protective Clothing and Breathing

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System